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Experimental Studies On Glass Microballoon Filled Epoxy Composites

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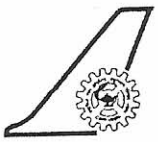

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Abstract: Experimental investigations were carried out to understand the effect of glass micro balloon filler on the mechanical properties of epoxy resin system, that is currently being used as a bonding medium between the spar and the blade shell of a typical 300 kW Carter Wind Turbine Blade construction. Three kinds of mechanical tests viz. tensile, compression and lap shear tests were carried out on the neat resin (unfilled) and the filled epoxy castings. The filler content was maintained constant at 10% by wt. of the resin, for all the samples. The results showed that the glass microballoon filler did not enhance any of the mechanical properties of the matrix, on the contrary, resulted in their reduction. It was also observed that, the addition of relatively low density filler reduced the density of the resin system, resulting in weight reduction. Based on these limited studies, it was inferred that the microballoon filler addition was mainly to achieve reduced part weight, in the spar to blade adhesive joint of the 300 kW Carter Wind Turbine Blade.